

ABSTRACT

In a novel method of 3D modeling of an object from a video sequence using an SfM algorithm and a generic object model, the generic model is incorporated after the SfM algorithm generates a 3D estimate of the object model purely and directly from the input video sequence. An optimization framework provides for comparison of the local trends of the 3D estimate and the generic model so that the errors in the 3D estimate are corrected. The 3D estimate is obtained by fusing intermediate 3D reconstructions of pairs of frames of the video sequence after computing the uncertainty of the two frame solutions. The quality of the fusion algorithm is tracked using a rate-distortion function. In order to combine the generic model with the 3D estimate, an energy function minimization procedure is applied to the 3D estimate. The optimization is performed using a Metropolis-Hasting sampling strategy.